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EXAMINER

FORMAN, BETTY J

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1634

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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FINAL ACTION

Status of the Claims

1. This action is in response to papers filed 24 October 2006 in which the title was amended and claims 30, 32-33, 35-38, 44-46, 48-49 were amended. The amendments have been thoroughly reviewed and entered. The previous objections and rejections in the Office Action dated 4 August 2006, not reiterated below, are withdrawn in view of the amendments. Applicant's arguments have been thoroughly reviewed and are discussed below as they apply to the instant grounds for rejection. New grounds for rejection, necessitated by the amendments, are discussed.

Claims 30-39 and 44-49 are under prosecution.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 44-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 44-49 are indefinite in Claim 44, (b), line 2 for the recitation "each manifold" because the recitation lacks proper antecedent basis in "a manifold" of step (a), line 3. The phrase "each manifold" refers to more than one manifold. However, step (a) only defines a single "a" manifold.

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Claim Rejections - 35 USC § 102/103

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 30-31, 33 rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Blanchard (WO 98/41531, published 24 September 1998).

Regarding Claim 30, Blanchard discloses an apparatus for biopolymer array synthesis (Fig. 5), the apparatus comprising a plurality of flow cells (page 74, line 32-page 75, 20), the flow cells comprising a chamber (#80, fig. 9) and a holder for the support (plate #70) wherein the support is a flat glass (page 57, lines 5-13) and the array comprises a plurality of biopolymer features in a pattern on the surface (2-d array, page 57, lines 5-7). Blanchard further discloses the apparatus comprising a fluid dispensing station in fluid communication with the flow cells (inlets in communication with solvent containers via valves and tubing, page 66, lines 2-12) a station for monomer addition, (print head assembly #24) and a mechanism for moving a support to and from the monomer addition station and a flow cell (scanning transport, #22 and treating transport #23) wherein the mechanism comprises a robotic arm (computer controlled transport arms, page 74, lines 8-31) and a holding element comprising a

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grasping element (grooved vacuum chuck , page 61, lines 21-32 and page 66, line 25-page 67, line 8).

Regarding Claim 31, Blanchard teaches the apparatus comprises a controller for controlled movement of the mechanism (computer controlled transport arms, page 74, lines 8-31).

Regarding Claim 33, Blanchard teaches the apparatus wherein the flow cells comprise inlet and outlet ports (#83 & #84, Fig. 5).

The preceding rejection is based on judicial precedent following *In re Fitzgerald*, 205 USPQ 594 because Blanchard is silent with regard to the transporter moving the support from one flow cell to another. However, the transporting mechanism recited in Claim 30 is deemed to be inherent in the multi-flow-cell device and transporters for moving supports into and out of the flow cells via x, y, z movement (page 66, lines 13-20). Because the transporters have the ability to move supports into and out of the flow cells, whether the transporters move the same or different supports in and out of different flow cells (i.e. from one flow cell to another) would be a matter of operator choice (i.e. use) but would not alter the structure of transporters. The claim is drawn to a device and the courts have stated that a device is defined by its structure i.e. "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Because Blanchard teaches the structural requirements for moving supports into and out of multiple flow cells, Blanchard teaches all the structural elements required by the claim.

Alternatively, it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to provide the transporters of Blanchard with the ability to move a support from one flow cell to the next because the supports, when positioned within the flow cells, are exposed to various solvents and reagents for rinsing, oxidation, deprotection

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(page 58, lines 1-12). It would have been obvious to one of ordinary skill to dedicate a flow cell for each reagent and provide means for moving supports to and from the different flow cells for reagent-specific treatment. For example, if a flow cell was dedicated to providing the rinsing solution, the outlet port could be directly coupled to a waste reservoir while a flow cell that provides a reusable solution e.g. for oxidation or deprotection, the outlet port could be adapted for recycling of that solution.

The burden is on applicant to show that the claimed (property X) is either different or non-obvious over that of Blanchard.

Claim Rejections - 35 USC § 103

6. Claims 34 and 39 rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard (WO 98/41531, published 24 September 1998) in view of Goldberg et al (5,959,098, issued 28 September 1999).

Regarding Claims 34 and 39, Blanchard discloses an apparatus for biopolymer array synthesis (Fig. 5), the apparatus comprising a plurality of flow cells (page 74, line 32-page 75, 20), the flow cells comprising a chamber (#80, fig. 9) and a holder for the support (plate #70) wherein the support is a flat glass (page 57, lines 5-13) and the array comprises a plurality of biopolymer features in a pattern on the surface (2-d array, page 57, lines 5-7). Blanchard further discloses the apparatus comprising a fluid dispensing station in fluid communication with the flow cells (inlets in communication with solvent containers via valves and tubing, page 66, lines 2-12) a station for monomer addition, (print head assembly #24) and a mechanism for moving a support to and from the monomer addition station and a flow cell (scanning transport, #22 and treating transport #23) wherein the mechanism comprises a robotic arm (computer controlled transport arms, page 74, lines 8-31) and a holding element comprising a

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grasping element (grooved vacuum chuck , page 61, lines 21-32 and page 66, line 25-page 67, line 8). Blanchard teaches the claimed fluidic station and monomer addition station in communication with a manifold but is silent regarding a manifold in fluidic communication with the flow cell. However, manifold communication with flow cells for delivery of different reagents for biopolymer synthesis was well known and routinely practiced in the art at the time the claimed invention was made as taught by Goldberg et al (Column 27, lines 12-33).

Goldberg teaches that this differential reagent delivery permits batch processing (Column 27, lines 13-15) thereby improves efficiency (Column 24, lines 10-14). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the manifold supplying differential reagent delivery taught by Goldberg to the apparatus of Blanchard. One of ordinary skill in the art would have been motivated to do so for the expected benefit of batch processing and efficiency advantages taught by Goldberg (Column 24, lines 10-14).

7. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard (WO 98/41531, published 24 September 1998) in view of Hillman et al (U.S. Patent No. 4,856,456, issued 15 August 1989).

Regarding Claim 32, Blanchard discloses an apparatus for biopolymer array synthesis (Fig. 5), wherein the apparatus comprise a holding element comprising a grasping element (grooved vacuum chuck , page 61, lines 21-32 and page 66, line 25-page 67, line 8) but is silent regarding finger-like projections on the vacuum chuck. However, vacuum chucks having finger-like projections were well known in the art of substrate processing as taught by Hillman et al.

Hillman teaches a device for treating a substrate surface wherein the substrate is positioned using a vacuum chuck (#104) having fingers (#152) wherein the fingers enhance the

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sealing between the substrate and vacuum chuck (Column 9, lines 1-9). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the vacuum chuck of Blanchard by adding the fingers of Hillman. One of ordinary skill in the art would have been motivated to do so for the expected benefit of improved sealing of substrate as taught by Hillman (Column 9, lines 1-9).

8. Claims 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard (WO 98/41531, published 24 September 1998) in view of Nokihara (U.S. Patent No. 5,362,447, issued 8 November 1994).

Regarding Claims 35-38, Blanchard discloses an apparatus for biopolymer array synthesis wherein the flow cells have an outlet but does not teach a purification system in communication with the outlet. However, automated synthesizers having column purification systems and sensors attached to flow cell outlets were well known in the art at the time the claimed invention was made as taught by Nokihara.

Nokihara teaches the apparatus wherein expensive and toxic reagents are recycled via a purification column (Column 4, lines 19-27) in communication with a sensor (pH sensor, Column 3, lines 58-67) valve switch (Column 4, lines 28-33) and holding chamber (e.g. fraction collector F, Column 3, lines 1-11). Nokihara teaches the purification system reduces costs by "significantly" reduces the amount of starting material consumed and environmentally destructive waste produced (Column 4, lines 34-44). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the sensor and purification system in the synthesizer of Nokihara to the synthesizer of Blanchard. One of ordinary skill in the art would have been motivated to do so for the expected benefits of reducing costs by "significantly" reducing the amount of starting material consumed and environmentally destructive waste produced (Column 4, lines 34-44).

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9. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard (WO 98/41531, published 24 September 1998) in view of Kedar (U.S. Patent No. 6,165,778, issued 26 December 2000).

Regarding Claim 38, Blanchard discloses an apparatus for biopolymer array synthesis, wherein the apparatus comprises detecting conditions within the flow cells (Fig. 14 and page 75, lines 1-7) but is silent regarding a sensor in fluid communication with an outlet. However, Kedar teaches an apparatus for array synthesis wherein the apparatus comprises a sensor in fluid communication with the outlet (#111S-119S, Column 74, lines 46-56 and Column 77, lines 35-46) wherein the sensor determines a condition of the reagents (e.g. presence, absence or data) communicates with the controller, which also communicates with the valves.

The claim further recites an intended use for the sensor and controller i.e. that the sensor communicates with a valve to direct fluid reagent to a flow cell or to wastes. However, the recitation of intended use does not further define the structure of the apparatus.

10. Claims 44, 46-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard (WO 98/41531, published 24 September 1998) in view of Goldberg et al (5,959,098, issued 28 September 1999) and Nokihara (U.S. Patent No. 5,362,447, issued 8 November 1994).

Regarding Claims 44, 46-49, Blanchard discloses an apparatus for biopolymer array synthesis (Fig. 5), the apparatus comprising a plurality of flow cells (page 74, line 32-page 75, 20), the flow cells comprising a chamber (#80, fig. 9) and a holder for the support (plate #70) wherein the support is a flat glass (page 57, lines 5-13) and the array comprises a plurality of biopolymer features in a pattern on the surface (2-d array, page 57, lines 5-7). Blanchard further discloses the apparatus comprising a fluid dispensing station in fluid communication with the flow cells (inlets in communication with solvent containers via valves and tubing, page

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66, lines 2-12) a station for monomer addition, (print head assembly #24) and a mechanism for moving a support to and from the monomer addition station and a flow cell (scanning transport, #22 and treating transport #23) wherein the mechanism comprises a robotic arm (computer controlled transport arms, page 74, lines 8-31) and a holding element comprising a grasping element (grooved vacuum chuck, page 61, lines 21-32 and page 66, line 25-page 67, line 8). Blanchard teaches the claimed fluidic station and monomer addition station in communication with a manifold but is silent regarding a manifold in fluidic communication with the flow cell. However, manifold communication with flow cells for delivery of different reagents for biopolymer synthesis was well known and routinely practiced in the art at the time the claimed invention was made as taught by Goldberg et al (Column 27, lines 12-33). Goldberg teaches that this differential reagent delivery permits batch processing (Column 27, lines 13-15) thereby improves efficiency (Column 24, lines 10-14). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the manifold supplying differential reagent delivery taught by Goldberg to the apparatus of Blanchard. One of ordinary skill in the art would have been motivated to do so for the expected benefit of batch processing and efficiency advantages taught by Goldberg (Column 24, lines 10-14). Blanchard and Goldberg do not teach a purification system and sensor in communication with the outlet. However, automated synthesizers having column purification systems and sensors attached to flow cell outlets were well known in the art at the time the claimed invention was made as taught by Nokihara.

Nokihara teaches the apparatus wherein expensive and toxic reagents are recycled via a purification column (Column 4, lines 19-27) in communication with a sensor (pH sensor, Column 3, lines 58-67) valve switch (Column 4, lines 28-33) and holding chamber (e.g. fraction collector F, Column 3, lines 1-11). Nokihara teaches the purification system reduces costs by "significantly" reduces the amount of starting material consumed and environmentally destructive waste produced (Column 4, lines 34-44). It would have been obvious to one of

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ordinary skill in the art at the time the claimed invention was made to apply the sensor and purification system in the synthesizer of Nokihara to the synthesizer of Blanchard and/or Goldberg. One of ordinary skill in the art would have been motivated to do so for the expected benefits of reducing costs by "significantly" reducing the amount of starting material consumed and environmentally destructive waste produced (Column 4, lines 34-44).

11. Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Blanchard (WO 98/41531, published 24 September 1998) in view of Goldberg et al (5,959,098, issued 28 September 1999) and Nokihara (U.S. Patent No. 5,362,447, issued 8 November 1994) as applied to Claim 44 above and further in view of Hillman et al (U.S. Patent No. 4,856,456, issued 15 August 1989).

Regarding Claim 45, Blanchard discloses an apparatus for biopolymer array synthesis (Fig. 5), wherein the apparatus comprise a holding element comprising a grasping element (grooved vacuum chuck, page 61, lines 21-32 and page 66, line 25-page 67, line 8) but is silent regarding finger-like projections on the vacuum chuck. However, vacuum chucks having finger-like projections were well known in the art of substrate processing as taught by Hillman et al.

Hillman teaches a device for treating a substrate surface wherein the substrate is positioned using a vacuum chuck (#104) having fingers (#152) wherein the fingers enhance the sealing between the substrate and vacuum chuck (Column 9, lines 1-9). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the vacuum chuck of Blanchard by adding the fingers of Hillman. One of ordinary skill in the art would have been motivated to do so for the expected benefit of improved sealing of substrate as taught by Hillman (Column 9, lines 1-9).

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Double Patenting

12. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

13. Claims 30-31, 33-34, 39 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 23-28 of copending Application No. 10/172,470. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to flow cell devices comprising a flow cell housing a substrate, fluid dispensing manifold, stations for reagent delivery and mechanical means for moving the support. The claim sets merely differ in that the '470 claims are further drawn to a vacuum source. However, the instant claim language "comprising" encompasses the additional element of the '470 claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

14. No claim is allowed.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (571) 272-0741. The examiner can normally be reached on 6:00 TO 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

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For all other customer support, please call the USPTO Call Center (UCC) at 800-786-9199.


BJ Forman, Ph.D.
Primary Examiner
Art Unit: 1634
January 11, 2007